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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	18

Application Number	09/425,234
Filing Date	October 25, 1999
First Named Inventor	RABIE
Art Unit	1723
Examiner Name	MENON, Krishnan S.
Attorney Docket Number	4320-91

ENCLOSURES *(check all that apply)*

- ☒ Fee Transmittal Form
- ☐ Fee Attached
- ☐ Amendment / Reply
- ☐ After Final
- ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
- ☐ Reply to Missing Parts under 37 CFR1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
- ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☒ Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) *(please identify below).*

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm	Bereskin & Parr		
Signature	Scott Pundsack		
Printed Name	Scott Pundsack		
Date	March 3, 2006	Reg No.	47,330

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Signature			
Typed or printed name	Janet Sanford	Date	March 3, 2006

PTO/SB/17 (12-04)
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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 0.00

Complete If Known	
Application Number	09/425,234
Filing Date	October 25, 1999
First Named Inventor	RABIE
Examiner Name	MENON, Krishnan S.
Art Unit	1723
Attorney Docket No.	4320-91

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☐ Deposit Account Deposit Account Number: 022095 Deposit Account Name: Bereskin & Parr

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
- 20 or HP =	0	x	= 0.00

HP = highest number of total claims paid for, if greater than 20

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
- 3 or HP =	0	x	= 0.00

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims Fee ($)	Multiple Dependent Claims Fee Paid ($)

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
- 100 =	0	/ 50 = [ ] (round up to a whole number)	x	= 0

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other: Appeal Brief Fee (37 CFR 41.20(b)(2)) - Previously Paid	0.00

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PTO/SB/17 (12-04)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 0.00

Complete If Known	
Application Number	09/425,204
Filing Date	October 25, 1999
First Named Inventor	RABIE
Examiner Name	MENON, Krishnan S.
Art Unit	1723
Attorney Docket No.	4320-91

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☐ Deposit Account Deposit Account Number: 022095 Deposit Account Name: Bereskin & Parr

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

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Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 20 or HP =	0 x	_____ =	0.00

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Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 3 or HP =	0 x	_____ =	0.00

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims Fee ($)	Multiple Dependent Claims Fee Paid ($)
_____	_____

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Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
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4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other: Appeal Brief Fee (37 CFR 41.20(b)(2)) - Previously Paid	0.00

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Bereskin & Parr
INTELLECTUAL PROPERTY LAW

Appl. No	:	09/425,234	Confirmation No.: 9266
Applicant	:	RABIE et al.	
Filed	:	October 25, 1999	
Title	:	MAINTENANCE CLEANING FOR MEMBRANES	
TC./A.U.	:	1723	
Examiner	:	MENON, Krishnan S.	
Docket No.	:	4320-091	
Customer No.	:	001059	

Board of Patent Appeals and Interferences
United States Patent and Trademark Office
P. O. Box 1450
Alexandria, Virginia 22313–1450

March 3, 2006

BRIEF IN SUPPORT OF APPEAL

Real Party in Interest

The Real Party in Interest in the present Appeal is Zenon Environmental Inc., the assignee, as evidenced by the assignment set forth at Reel 012977, Frame 0477.

Related Appeals and Interferences

This appeal is related to appeals pending in Application Nos. 09/916,247 and 10/461,687. There have not been any decisions rendered in either of these Appeals as of the date of this Brief.

Status of Claims

Claims 1-4 and 18-38 have been cancelled. Claims 5 to 17 remain pending and are being appealed. A copy of the appealed claims appears in the Claims Appendix.

Status of Amendments

No amendments have been filed after the Rejection of October 5, 2005.

Summary of the Claimed Subject Matter

The claimed invention relates to a method of cleaning one or more membranes normally immersed in water containing solids in a tank (page 5, lines 17-19 and 21-25; "membranes 24", "tank water 22", "tank 20" shown in Figure 1). The one or more membranes are arranged into one or more modules such that permeate sides of the one or more membranes enclose a space in communication with one or more headers of the one or more modules (page 6, lines 15-19; "permeate side 25", "headers 26" and "module 28" shown in Figure 1). The membranes are used to produce a filtered permeate (page 6, lines 24-27; "permeate 36" shown in Figure 1). As water from the tank flows through the membranes, solids in that water are rejected by the membranes (page 7, lines 14-17). Thus, during permeation, water with a reduced concentration of solids (permeate) is presented in the enclosed space of the modules. This permeate flows to the headers from where it can be removed from the tank (page 6, lines 26-27). However, during permeation the membranes become dirty or fouled (page 8, lines 1-2). If permeation simply continued, the fouling would eventually cause the permeability of the membranes to decline to an unacceptable level. The claimed invention addresses this issue by providing a method of cleaning the membranes.

Claim 5 relates to a method of cleaning having cleaning events, the cleaning events having three basic steps as set out below:

(a) stopping permeation (page 9, lines 25-28);

(b) after stopping permeation and before resuming permeation, flowing a chemical cleaner to the one or more headers in a series of pulses, wherein the pulses are separated from each other by waiting periods in which the flow of chemical cleaner is stopped (page 14, line 28 to page 15, line 14);

(c) after step (b), resuming permeation (page 17, lines 14-16);

These three steps are performed according to the following qualifications specified in claim 5:

(d) the membranes remain immersed in the water containing solids while the chemical cleaner flows to the one or more headers (page 15, lines 6-8);

(e) the outside of the membranes is in fluid communication with the water containing solids (page 6, lines 15-18); and,

(f) during step (b), all chemical cleaner reaching the one or more headers remains in the enclosed space of the one or more modules or flows through the walls of the membranes in a direction opposite to the direction in which permeate normally passes through the walls of the membranes (page 9, lines 25-30).

As set out above, claim 5 includes in step (b) flowing a chemical cleaner to the one or more headers in a series of pulses separated from each other by waiting periods in which the flow of chemical cleaner is stopped. As specified in part (f) of the claims, during step (b) all chemical cleaner reaching the one or more headers remains in the enclosed space of the one or more modules or flows through the walls of the membranes in a direction opposite to the direction in which permeate normally passes through the walls of the membranes. Delivering the chemical cleaner in pulses separated by waiting periods as in part (b) of claim 5 under the dead end flow regime of part (f) of claim 5 allows a higher pressure to be used to deliver the chemicals which assists in reducing the relative size of head variations or pressure losses in the system and provides a more even distribution of chemical cleaner across the surface of the membranes (page 14, lines 10-17). The waiting periods also allow the chemical cleaner time to react with the foulants before delivery of more chemical cleaner pushes the earlier applied cleaner out of or away from the membranes (page 14, lines 2-8; page 15, lines 15-22).

Claims 6-17 depend on claim 5 and add additional limitations to claim 5.

Claim 6 states that the cleaning events of claim 5 are repeated generally periodically at a frequency between 1 and 7 times per week between more intensive first cleanings performed at least 15 days apart (page 12, lines 11-15; page 13, lines 15-21). Claim 7 depends on claim 6 and provides a "weekly CT" for the cleaning events, that is a sum of the product of the concentration of the cleaning chemical and the time during which the chemical cleaner remains effective in the area adjacent the membranes (page 12, lines 2-10 and 21-22) for all cleaning events performed in a week.

The method described in claims 6 and 7 is called "maintenance cleaning" and described, for example, at page 8, line 1, to page 9, line 12, and page 12, lines 11-20 of the specification. As described in the specification, the cleaning events of claim 5 may be intentionally designed so that they are insufficient to keep the permeability of the membranes from declining over large periods of time. However, because the cleaning events may be performed quickly and provide minimal damage to the membranes or disruption to the water treatment process, the cleaning events can be performed frequently. The frequent small cleaning events act as a preventative measure and serve to extend the time between necessary, but harsher and more disruptive, intensive cleanings.

Claims 8-10 further limit the range of weekly CT of claim 7 (page 12, line 21 to page 13, line 4). Claims 11-13 further define the duration of the pulse steps and waiting periods (page 14, line 28 to page 15, line 1). Claims 14 and 15 define the pressure of the pulses (page 4, lines 25-27) and the resulting flow of chemical cleaner through the membranes (page 15, lines 3-6). Claims 16 and 17 describe a process according to claim 5 having an additional step of removing chemical cleaner from the tank through a drain in the tank before permeation is resumed (page 17, lines 8-11).

Grounds of Rejection to be Reviewed on Appeal

1. Double Patenting

Claims 5-17 were provisionally rejected for obviousness type double patenting in view of claims 1-23 of Application Serial No. 11/106,681.

2. Rejections Under 35 USC 112

Claims 6-10 were rejected for indefiniteness. The Examiner alleges that the limitation of "more intensive first cleaning" in claim 6 lacks antecedent precedent.

3. Rejections Under 35 USC 102

Claims 5-10 and 13-17

Claims 5-10 and 13-17 were rejected as being anticipated by Smith et al., U.S. Patent No. 5,403,479 (Smith '479). Claims 5-10 and 13-15 were previously rejected as being

obvious in view of Smith '479. In response to a previous Appeal Brief filed August 25, 2005, the Examiner has dropped the obviousness rejections and now makes only anticipation rejections. Accordingly, the Applicants submit that the current rejections are strictly anticipation rejections.

4. Claim Rejections Under 35 USC 103

Claims 11 and 12 were rejected as being obvious over Smith '479. The Examiner alleges that the additional limitations of these claims are obvious optimizations of result effective variables.

ARGUMENT

1. Double Patenting

Application No. 11/106,681 was filed after the application under appeal and is the basis for a provisional rejection. Pursuant to MPEP 804, Parts IB 1 and 2, this provisional rejection should ultimately be withdrawn and a non-provisional rejection made in 11/106,681. Accordingly, the Applicants submit that a discussion of the merit of this rejection is not required in this appeal.

2. Rejections Under 35 USC 112

Claim 6 states, "The method of claim 5 wherein the cleaning events are repeated generally periodically at a frequency between 1 and 7 times per week between more intensive first cleanings performed at least 15 days apart to increase the permeability of the membranes."

Since claim 6 depends on claim 5, it is clear the "the cleaning events" are the cleaning events defined in claim 5. The Applicants submit that it is further clear that claim 6 is adding an additional element of "first cleanings". The Examiner states that "any additional cleaning step is assumed as the more intensive first cleaning". The Applicants submit that it is clear that the first cleanings are more intensive than the cleaning events of claim 5.

The notes for paragraph 7.34.05 in MPEP 706.03(d) state that a claim should only be rejected as being indefinite for lack of antecedent precedent in "aggravated" situations.

The present phrase, "more intensive first cleanings" was introduced by an amendment of January 14, 2004. The Application has been through four Office Actions since that time dated December 2, 2004, June 22, 2004, May 5, 2004 and February 17, 2004 without a Section 112 rejection. Even in the most recent Office Action of October, 5, 2005, page 6, the Examiner states that claim 6 "adds the frequency of the cleaning events as 1-7 times per week and also adds a more intensive cleaning 15 days apart", indicating that the Examiner understands that the "first cleanings" of claim 6 are more intensive than the "cleaning events" of claim 5. The Applicants submit that claim 6 is clearly not indefinite. Further, the record shows that the Examiner understands the claim well enough to examine it and that claim 6 is certainly not an "aggravated" case justifying rejection under Section 112.

3. Claim Rejections Under 35 USC 102

Claim 5

The Appellants submit that Smith does not anticipate claim 5, particularly because Smith '479 does not teach a process having step (b) of claim 5 or step (b) of claim 5 in combination with step (f) of claim 5.

Step (b) of claim 5 requires "flowing a chemical cleaner to the one or more headers in a series of pulses, wherein the pulses are separated from each other by waiting periods in which the flow of chemical cleaner is stopped". The Examiner cites column 11, lines 29-47, which is repeated below:

> The method comprises maintaining a selected low pressure no more than the bubble-point either continuously, or cyclically applied, over a short period of time, preferably less than 1 hr, sufficient to diffuse enough cleaning fluid through pores in the membrane into the dirty water, substantially to re-establish the initial stable flux The low pressure may be substantially constant, or it may be deliberately varied within a period of less than 5 sec, preferably less than 1 sec. When pulsed to achieve pulsed diffusion, the pressure exerted by the cleaning fluid may vary from

> a minimum of about 100 kPa (1 bar, at least 0.1 psig, preferably 0.5 psig) for a "loose" MF (5 μm) to a maximum of 100 psig for a "tight" UF (50Å), within less than 1 sec, which pulsing affords diffusion-controlled permeation. The pulsed maximum pressure which provides diffusion-controlled flow depends upon the pore size and distribution of the membrane but is generally no higher than about 300 kPa.

The Examiner states that "the cyclic varying of the pulses also implies stopping flow in between pulses". The Applicants submit that the cited passage describes a pulse varying from a minimum pressure to a maximum pressure. For example, column 11, lines 35-37 state that, "The low pressure may be substantially constant, or it may be deliberately varied within a period of less than 5 sec, preferably less than 1 sec." The cited reference further provides the minimum and maximum range for the low pressure part of the cycle. The Applicants submit that the cited reference suggests that flow may be at a decreased rate during part of the cycle but does not imply stopping flow between pulses. Accordingly, Smith '479 does not disclose part (b) of claim 5.

Claim 5 further requires, through parts (b) and (f), a combination of a dead end, or non-recirculating, flow of chemical cleaner such that all chemical cleaner reaching the header(s) of the module remains in the module or flows through the membrane walls in pulses separated by waiting periods in which the flow to the module is stopped.

In constrast, it is clear that some cleaning chemical in the method of Smith leaves the module to recirculate back to a tank where the cleaning chemical was originally stored (Figure 2 and column 17, lines 7-44). Smith '479 says explicitly in col. 11, lines 62-63, that, "the clean-in-place process of this invention does not dead-end the fibers to be cleaned". The Examiner cites column 17, lines 50-56 as reciting dead end flow. This citation is repeated below:

> Check valve 23 is left open when cleaning solution is either circulated with pump 24 or pulsed when a pulse pump is substituted for pump 24. In those instances where it is desired to "dead end" the biocidal solution under only enough pressure to permit its diffusion-controlled flow out of the fibers, both the check valves 26 and 28 are closed.

Although, in contrast to the discussion in column 11, lines 22-61, the citation above refers to dead end flow, pulsed flow is only taught in relation to a recirculation flow. There is no teaching of a combination of a pulsed flow, particularly a pulsed flow as defined by part (b) of claim 5, with dead end flow.

Claim 6

The Examiner cites Figure 4 of Smith '479 and states that data points 1 and 6 are about 15 days apart and provide intensive cleaning while the data points in between provide the cleaning events of claim 5. Data points 1 and 6 are separated by about 10.5 days whereas claim 6 requires first cleanings performed at least 15 days apart. Data points 2, 3 and 4 relate to cleaning with water alone, whereas claim 5 requires cleaning with a chemical cleaner. The remaining data point 5 is not performed between 1 and 7 times per week as required by claim 6. Accordingly, claim 6 is not anticipated.

Claims 7 to 10

Claims 7 to 10 depend on claim 6. The Examiner cites Figure 4 of Smith '479 and calculates a CT for the data point 5. The Examiner then goes on to propose that, "If one were to use the pulse cleaning step for one hour duration, or have the hypochlorite in every one of the event cleaning in figure 4, this would be about 10,000 or more." The Applicants submit that calculation based on data point 5 is improper because data point 5 is not a cleaning event performed between 1 and 7 times per week. Further, hypothesizing about what could be done is improper in an anticipation rejection.

The Examiner also alleges that the CT values claimed relate to a result effective variable. The process of claim 6 is not provided in Smith '479 and the Examiner has not established a prima facie case that the weekly CT claimed is merely the obvious optimization of a variable taught to be result effective in the process of Smith '479. In contrast, Smith '479 is concerned with cleaning of the membranes to restore their flux (col. 12, lines 26-55) not to extend the time between necessary more intensive cleanings. Optimizing a process according to Smith's teaching is therefore unlikely to produce a CT parameter in the range claimed in the context of the process of claim 6. In any event, optimization of a result effective variable is a doctrine relating to the obviousness of ranges, not anticipation, and the Examiner has already withdrawn his previous obviousness rejection of claims 5 to 10.

Claim 13

Regarding claim 13, the Examiner cites a general discussion in the abstract and at column 14, lines 33-68, of the action of a cleaning chemical which does not anticipate the claimed length of pulse step and waiting period.

Claim 14

Regarding claim 14, the Examiner cites pressures from col 11 of Smith which relate to a process in which the cleaning chemical recirculates through the membrane lumens and out of the membrane module (column 11, lines 22-29 and 62-63). The Applicants submit that this is irrelevant to claim 14 which, because it depends on claim 5, requires that chemical cleaner not recirculate through the lumens as in Smith '479.

Claim 15

Regarding claim 15, the flow through the membrane walls in Smith '479 is not inherent in the device but a function of the permeability of the membranes used, the applied pressure, the length and internal diameter of the membranes and the

flow regime, in Smith '479, which provides for flow into and out of the module through a second header. Claim 15, because it depends on claim 5, does not relate to a system where chemical cleaner flows out of a module through a second header and so relates to a different mode of operation. For this reason, and because Smith does not describe the membranes well enough to know what flow would occur through them, the inherency argument fails.

Claims 16 and 17

Regarding claims 16 and 17, the Examiner states that Smith teaches that draining the tank is unnecessary at col 11, lines 50-56. The Applicants submit that Smith '479 does not say that draining the tank is unnecessary, but rather that draining the tank is not done (see for example col 11, lines 24-25) and that draining the tank is an undesirable aspect of some prior art processes (col 10, lines 59-68). The statement in Smith '479 at column 11, lines 50-56 is as follows:

> The amount of cleaning fluid discharged into the feed is so small with each cleaning cycle that, even after an arbitrarily large number of cycles greater than 1000, continued withdrawal of permeate from the feed contaminated with cleaning fluid, does not deleteriously effect the permeate quality.

The Examiner states that this "would imply that one could drain the tank". The Applicants submit that this passage does not imply anything of the sort, and further that a reference that "would imply that one could" do anything is not anticipatory.

4. The Section 103 Rejection of Claims 11 and 12

Claims 11 and 12 define pulse and waiting period durations. The Examiner rejects these claims as relating to the optimization of a result effective variable Smith '479 does not relate to the claimed process. Further, to the extent that Smith discusses some form of pulsing, Smith '479 states that pressure may be varied, "with a period of less than 5 sec, preferably less than 1 sec". The

Applicants submit that this teaches away from claims 11 and 12 which recite the periods of about an order of magnitude more.

For the reasons above, the Applicants respectfully submit that the rejection of claims 5-17 is in error and requests reversal of these rejections.

Respectfully submitted,

BERESKIN & PARR

By _____
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CLAIMS APPENDIX

5. A method of cleaning one or more membranes normally immersed in water containing solids in a tank, the one or more membranes arranged into one or more modules such that permeate sides of the one or more membranes enclose a space in communication with one or more headers of the one or more modules, and used to produce a filtered permeate comprising:

performing cleaning events having the steps of:

(a) stopping permeation;

(b) after step (a), and before resuming permeation, flowing a chemical cleaner to the one or more headers in a series of pulses, wherein the pulses are separated from each other by waiting periods in which the flow of chemical cleaner is stopped;

(c) after step (b), resuming permeation;

wherein

(d) the membranes remain immersed in the water containing solids while the chemical cleaner flows to the one or more headers;

(e) the outside of the membranes is in fluid communication with the water containing solids; and,

(f) during step (b), all chemical cleaner reaching the one or more headers remains in the enclosed space of the one or more modules or flows through the walls of the membranes in a direction opposite to the direction in which permeate normally passes through the walls of the membranes.

6. The method of claim 5 wherein the cleaning events are repeated generally periodically at a frequency between 1 and 7 times per week between more intensive first cleanings performed at least 15 days apart to increase the permeability of the membranes.

7. The method of claim 6 wherein

(i) each cleaning event has a CT which is equal to (A) the concentration of the chemical cleaner expressed as an equivalent concentration of NaOCl in cleaning efficacy multiplied by (B) the time during which the chemical cleaner remains effective in the area adjacent the membranes; and,

(ii) the cleaning events have a weekly CT which is equal to the sum of the CT's of the one or more cleaning events performed in a week and is between 2,000 minutes•mg/L and 30,000 minutes•mg/L;

8. The method of claim 7 wherein the weekly CT is between 2,000 minutes•mg/L and 20,000 minutes•mg/L.

9. The method of claim 6 wherein the permeate is intended for drinking water and the weekly CT is between 5,000 minutes•mg/L and 10,000 minutes•mg/L.

10. The method of claim 6 wherein the water containing solids is a wastewater and the weekly CT is between 10,000 minutes•mg/L and 30,000 minutes•mg/L.

11. The method of claim 5 wherein the pulse steps last for between 10 seconds and 100 seconds and the waiting periods last for between 50 seconds and 6 minutes.

12. The method of claim 5 wherein the pulse steps last for at least 10 seconds and the waiting periods last for at least 50 seconds.

13. The method of claim 5 wherein the length of the pulse steps is selected to provide chemical cleaner in an area in the membranes and in an area in tank water adjacent the outside of the membranes with an initial efficacy and the length of the waiting periods is selected to provide substantially effective chemical cleaner in an area in the membranes and an area in tank water adjacent the outsides of the membranes during the waiting period.

14. The method of claim 5 wherein the membranes are hollow fibre membranes and the pressure of the cleaning chemical in the pulse steps is between 5 kPa and 55 kPa above the pressure on the outside of the membranes.

15. The method of claim 14 wherein the flow through the membranes during the pulse steps is between 8.5 and 51 $L/m^2/h$.

16. The method of claim 5 wherein chemical cleaner is removed from the tank through a drain in the tank before permeation is resumed.

17. The method of claim 16 wherein substantially all of the chemical cleaner is removed from the tank through a drain in the tank before permeation is resumed.